



Dave's Corner

3" Vs. 4" Pipe

The factors influencing the choice of 3 inch vs 4 inch pipe in a radon mitigation system include cost, ease of use, aesthetics and system performance. Generally 3 inch pipe is cheaper and easier to install. The fittings for 3 inch pipe are smaller, less costly and easier to tuck unobtrusively into a corner. Usually the factors of most importance to the homeowner are price and the appearance of the finished radon system. The homeowner is not concerned about pipe pressure losses because the Radon Professional usually provides a guaranty of the system performance and radon reduction. Given that typical residential radon systems move 20 to 80 cubic feet per minute (cfm), 3 inch pipe is best suited for most system installations although 4 inch pipe can be quieter due to lower air velocities.

When should you consider 4 inch pipe for system performance reasons? Anytime when the final system is expected to have much higher than average airflow (greater than 100 cfm), such as:

Walk-out basements - The exposed foundation walls will typically leak much more air than a fully buried basement.

Very large slabs - Again, more air will generally be available from the slab perimeter.

Combined subslab & submembrane system - Submembrane systems cannot be completely sealed and will always leak more air than a subslab. The fan and pipe system must have enough capacity to effectively treat the subslab area given higher airflow from the submembrane portion of the system.

At airflows greater than 100 cfm, 30 feet of 3 inch pipe can cause significant system performance losses. If you do not plan for the higher airflow in these types of systems by using 4 inch pipe, you may find yourself "pipe bound" and unable to move enough air even using a fan with a much higher air moving capability. Then you may be faced with the ugly prospect of removing the 3 inch pipe to install 4 inch pipe to accommodate the higher airflow requirements.

There is also a concern about condensation drainage in 3 inch pipe as the airflow approaches 100 cfm. The velocity of the air inside the pipe can actually prevent water condensation droplets on the inside of the pipe from flowing downward towards the suction point. Instead, the water will follow the airstream upward that may cause an accumulation of water inside the pipe or the fan unit and create gurgling noises or fan problems. 4 inch pipe will slow the air velocity and allow the water to drain normally.